

FACULTY OF SCIENCE
MCA III – SEMESTER REGULAR EXAMINATIONS, JAN – 2025
SOFTWARE ENGINEERING
PAPER – I

Time: 3 hours]

[Max. Marks: 70

Note: Answer all questions from Section – A and Section – B

Section – A

Answer the following questions in not more than **ONE** page each: (5x4=20)

1. What is meant by Software and Software Engineering? Write about Software Cost.
2. Specify the values of a Good SRS.
3. How to estimate the Efforts?
4. What is Code Inspection?
5. Explain software maintenance.

Section – B

Answer the following questions in not more than **FOUR** page each: (5x10=50)

6. a) Explain the Software Problem in terms of Scale and Change.
(OR)
b) Describe the Component Software Processes.
7. a) Explain Functional Specifications with Use Cases.
(OR)
b) Explain different Software Architecture Views.
8. a) Explain Quality Planning.
(OR)
b) Describe Detailed Design Concepts.
9. a) Write the Programming Principles of Coding. Explain incrementally developing code.
(OR)
b) Explain Testing Process in White Box Testing.
10. a) Describe Software Process Improvement process.
(OR)
b) Discuss the Economics of Reengineering. Differentiate Reverse Engineering and Reengineering.

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FACULTY OF SCIENCES
MCA III – SEMESTER REGULAR EXAMINATIONS, FEB – 2025
COMPUTER NETWORKS
PAPER – II

Time: 3 hours]

[Max. Marks: 70

Note: Answer all questions from Section – A and Section – B

Section – A

Answer the following questions in not more than **ONE** page each: (5x4=20)

1. With suitable example explain simplex, half-duplex, full-duplex communication.
2. Give an algorithm for CRC method of error checking.
3. Explain IPv6. Discuss its features, advantages over IPv4, and its addressing scheme.
4. Explain the concept of multiplexing in networking. Discuss the different types of multiplexing techniques.
5. Explain the built-in HTTP request methods.

Section – B

Answer the following questions in not more than **FOUR** page each: (5x10=50)

6. a) Explain in detail about ISO-OSI reference model.
(OR)
b) Explain transmission media of physical layer.
7. a) Discuss the advantages and disadvantages of the sliding window protocol. Explain how the protocol works with Go-Back-N and Selective Repeat approaches.
(OR)
b) Explain the Ethernet IEEE 802.3 standard. How is the efficiency of a LAN Ethernet Network calculated?
8. a) Explain the Link State Routing Algorithm with suitable example.
(OR)
b) Explain the OSPF protocol used for interior gateway routing in internet.
9. a) Illustrate TCP congestion control algorithm with the help of an example.
(OR)
b) Discuss QoS in networking. How does QoS affect the User Datagram Protocol (UDP), and what are the challenges in implementing QoS with UDP?
10. a) Explain the difference between iterative and concurrent client-server programs. Discuss their working mechanisms, advantages, and limitations.
(OR)
b) What is SMTP? Discuss its working mechanism, components, and its role in sending and receiving emails.

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FACULTY OF SCIENCES
MCA III – SEMESTER REGULAR EXAMINATIONS, FEB – 2025
DATA SCIENCE
PAPER – III

Time: 3 hours]

[Max. Marks: 70

Note: Answer all questions from Section – A and Section – B

Section – A

Answer the following questions in not more than **ONE** page each:

(5x4=20)

1. Why R language to be used? Write its features.
2. What is the use of cbind() and 'as' operator in R programming?
3. Write about Model Fitting.
4. What is Decision Tree? List out its advantages.
5. How to add legend to the right in a pie chart? Write a code in R.

Section – B

Answer the following questions in not more than **FOUR** page each:

(5x10=50)

6. a) What is a Vector and List?

i) Write a code in R to create a vector with(4,7,9)elements , assign names to vector elements as "INDIA","MIDDLEEAST","US" and plot a bar graph

Using the above vector elements add another vector (1,2,3,) and print the result

ii) Write a code in R to create a list in R ("EmpName="Alex", EmpUnit = "IT", EmpSal = 55000) , retrieve names and values of elements in list , add or delete an element from list and finally create another list and combine it into single list and print.

(OR)

b) Discuss the methods of Reading Data from CSV files, and JSON File with clear steps.

7. a) What is Data Frame and how to merge the data frames? Using mtcars data set apply five different functions to explore the data frames.

(OR)

b) What is Descriptive Statistics? How it is useful to Data Science? Using mtcars data set apply Range(), frequency(), mean(), median() and display first and last five rows.

8. a) What is Linear Regression? Discuss about steps to create lm() model.

(OR)

b) Discuss about Logistic Regression in detail.

9. a) What is the use of " rpart" package? Write step by step process to create Decision tree for the following problem statement Objective: To determine whether a child is a native speaker or not based on his/her age and scores in the reading test.

(Use dataset "reading Skills).

(OR)

b) Explain Reading and Plotting Time series Data in detail.

10. a) What is Clustering? Explain k-Means Algorithm in detail.

(OR)

b) What is Frequent Itemset? Explain Apriori Algorithm.

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FACULTY OF SCIENCES
M. C. A. III – SEMESTER REGULAR EXAMINATIONS, FEB – 2025
WEB TECHNOLOGIES
PAPER – IV

Time: 3 hours]

[Max. Marks: 70

Note: Answer all questions from Section – A and Section – B

Section – AAnswer the following questions in not more than **ONE** page each: (5x4=20)

1. Illustrate how nested lists are created in HTML with examples.
2. What is object referencing in HTML DOM (Document Object Model)? Explain.
3. Explain in detail the different data types available in JavaScript.
4. Discuss the various control structures in VBScript.
5. Differentiate client-side scripting and server-side scripting.

Section – BAnswer the following questions in not more than **FOUR** page each: (5x10=50)

6. a) What are meta tags in HTML? Explain how they are used to provide metadata for a webpage.

(OR)

- b) Describe how CSS can be used to modify the appearance of text in a webpage.

7. a) Why is event handling important? Discuss how events like ONCLICK, ONLOAD, and ONERROR enhance user interaction and error management.

(OR)

- b) Describe the concept of filters in Dynamic HTML (DHTML).

8. a) Describe how arrays are created, used, and manipulated in JavaScript.

(OR)

- b) Illustrate how global functions in JavaScript can be used to perform common tasks.

9. a) Explain the methods for string manipulation in VBScript and provide examples.

(OR)

- b) Discuss the Apache Web Server, and its key features.

10. a) Illustrate the use of XML parsers in processing XML documents.

(OR)

- b) Illustrate how ADO (ActiveX Data Objects) is used in server-side scripting.

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FACULTY OF SCIENCES
MCA III – SEMESTER REGULAR EXAMINATIONS, FEB – 2025
NETWORK SECURITY
PAPER – V (b)

Time: 3 hours]

[Max. Marks: 70

Note: Answer all questions from Section – A and Section – B

Section – AAnswer the following questions in not more than **ONE** page each: (5x4=20)

1. Explain how hashing algorithms ensure data integrity.
2. What is AES, and why is it considered more secure than DES?
3. What is a Message Authentication Code (MAC) and how does it ensure data authentication?
4. Describe how the Proof of possession interface ensures that an entity owns the private key corresponding to a public key.
5. What are the components of a Kerberos ticket and how do they ensure secure authentication?

Section – BAnswer the following questions in not more than **FOUR** page each: (5x10=50)

6. a) What is a replay attack, and how does it compromise security? Discuss the role of session tokens in mitigating replay attacks.
(OR)
b) What is a computer virus, and how does it differ from other malware? Explain the lifecycle of a computer virus.
7. a) What is DES, and how does it ensure data confidentiality? Describe the Feistel structure used in DES encryption.
(OR)
b) Explain the key generation process in RSA. How does RSA encryption and decryption work?
8. a) What is a hash function, and why is it essential for ensuring data integrity? Explain the working principle of MD5.
(OR)
b) What is Digital Signature? Explain DSA Signature.
9. a) What is a digital certificate, and why is it essential in a PKI? Explain the structure of a digital certificate.
(OR)
b) What is a Zero Knowledge Protocol, and how does it work? Explain how Zero Knowledge Protocols enhance the security of smart cards.
10. a) What is the Secure Sockets Layer (SSL) protocol, and how does it ensure secure communication? Explain the SSL handshake process and its key steps.
(OR)
b) What are micro-payments, and why are they important in digital economies? Discuss the key challenges in designing secure micro-payment systems.

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